AL. 1.941

TECHCITING Alberta

APRIL 1987 ISSUE 1

The Cleanest Place in Town

If cleanliness is next to godliness, then the new production facility at the Alberta Microelectronic Centre is about as close to such lofty ideals as most mere mortals will ever get.

Located in the Robert Newton building at the University of Alberta campus, the Alberta Microelectronic Centre (AMC) production facility consists of six class 10 clean rooms (each room represents a processing step in microchip production) and a gowning room, all of which are connected by a clean hallway.

So how clean is clean?

Cleanliness, as defined for microelectronics, is based on the number of airborne particles within an average cubic foot of air space. For example, if you're reading this article in your office, there are probably about one million airborne dust particles between your eyes and the page—and that's if your janitorial service is particularly efficient!! The hallway connecting the clean rooms is comparable to a hospital's operating theatre, and contains about 1,000 airborne dust particles per cubic foot.

But the class 10 clean rooms are by far the cleanest of all. With fewer than 10 particles per cubic foot, they have 100 times less dirt and dust than a sterile environment in which open heart surgery can be performed.

"The cleanliness of the rooms is a reflection of size of devices we're dealing with," says Len Friedenberg, general manager of the centre. "We're processing silicon wafers and some of the features we use may have a dimension of two microns (two-thousandths of a millimetre). If you have a dust particle five microns large sitting on the feature, by comparison it would look like a large rock sitting on the microelectronic circuit."

The Alberta Microelectronic Centre will help Alberta companies improve productivity by identifying and adapting microelectronic applications for their products and operations

The air within the production facility is kept clean with a complex filtration process. Air entering the area around the production facility, the clean hallway, and clean rooms is kept constantly circulated through a high efficiency filter. And indeed, air within each clean room is changed every six minutes.

Air pressure is an important element in keeping the rooms clean. The pressure is greatest in the cleanest area, and this tends to force impurities into the other areas. Also, the air inside the rooms is circulated from top to bottom, which tends to force any dust particles and other impurities toward the floor.

Entering the production facility is like entering a time warp somewhere between General Hospital and Star Trek. Workers are gowned from head to toe, and are even subjected to an air shower that blows loose dirt and dust from their clothing.

Cont'd on page 5

INSIDE

Message From the Minister	2
This Spud's for You	2
Supercomputer Symposium	2
TECH-BITS	3
Custom Chips Expand Rural Telephone Use	3
A Grass-Roots Technology Transfer	5
Eureka / Toep Projects	6

Message from the Minister

Welcome to *Techciting Alberta*. It's significant how the name of this publication parallels the advances occurring in Alberta at this time. The traditional sectors of oil and gas, and agriculture are challenged by poor economic conditions and low world oil prices. While these sectors will remain major sources of economic activity, Alberta must continue to build on other advantages this province enjoys, such as tourism, forestry and advanced technologies in order to further diversify the provincial economy.

The Department of Technology, Research and Telecommunications was established one year ago to ensure that an environment and infrastructure exists to provide companies with access to advanced technologies, assist companies to develop new technologies and products, and to encourage the transfer of technology from our universities to industry.

Les Young
Technology, Research and Telecommunications

Creation of this infrastructure began years ago with the formation of the Alberta Research Council. In the past few years, the Government, with input from educational institutes and industry, has identified key areas to concentrate our efforts. Facilities or "building blocks" have been established to assist the development of technology in the areas of electronics, biotechnology, microelectronics, lasers, telecommunications, and computers.

It will take some time to see the results, but the indication of growth is encouraging. Presently this sector in Alberta consists of 1,000 to 1,200 companies with $1 billion in revenues employing over 9,000 people. The continued growth will provide our young people with the opportunity for quality jobs.

Techciting Alberta will explore the high-tech industries in Alberta. I welcome your comments and hope you find this newsletter interesting, informative and helpful.

This Spud's For You

Here's a product you can really sink your teeth into. Buncha Ooraikul, a University of Alberta food processing scientist, has developed a patented formula for a man-made skin for a potato.

While it may seem a little bizarre, the synthetic (Ooraikul prefers to call it recombined) skin appeals to Jack Iwabuchi, President of I & S Produce Ltd. Iwabuchi wanted a processed potato product developed to break into the baked potato market since only 10 per cent of Alberta produced potatoes meet Canada's No. 1 standing for commercial baking.

Iwabuchi's cooked mashed potato inside Ooraikul's fabricated skin has just 40 calories unlike frozen fries or formed potato products which tend to be saturated in oil. The unconventional spud also cooks in half the time compared to its natural cousin.

There is a patent pending on the processing machinery, now churning out 400 look-alikes an hour at the provincial government's Leduc food processing centre. Iwabuchi predicts that in 18 months a full fledged production plant will be processing 10,000 potatoes an hour.

Supercomputer Symposium, 1987

Supercomputing Services of The University of Calgary will be holding a Supercomputing Symposium "Supercomputing From the Users' Perspective: Experience, Expectations, and Potentials" June 15-16, 1987 at the University of Calgary.

For further information contact: Kristen Mollin (403) 284-6463 or Dorinda Wong (403) 284-6472 at Supercomputing Services, The University of Calgary, Suite #390, 1620 - 29th Street, N.W., Calgary, Alberta T2N 4L7.

From the Editor

This is the first issue of *Techciting Alberta*, and as such we are still working on our distribution list. If you would like to receive a copy, please write us at the address below. Give us your name, title, company, and reason for receiving the newsletter and we'll add you to the distribution list.

Techciting Alberta is what the name suggests. It will be a compendium of information about the exciting and interesting world of high-tech in Alberta and it should appeal to a wide audience.

This newsletter will evolve, improving to meet the needs of our readers. But, in order to do so, we need your comments, suggestions and contributions. Please write Corporate and Public Relations, Technology, Research and Telecommunications, 12th floor Pacific Plaza, 10909 Jasper Ave., Edmonton, Alberta T5J 3M8. Telex 037-42687, Telefax (403) 420-1474.

TECH-BITS

A regular feature highlighting activities at facilities and institutes in Alberta's high-tech infrastructure.

The **Alberta Laser Institute** has received high power (5 kw) laser based metalworking machinery for its materials processing centre in Edmonton. This system forms the base of one of the most modern laser materials processing centres in North America. Alberta manufacturing companies using steel will benefit from the laser's many uses, including welding, heat treating (for hardening steel), metal cutting, or cladding (adding a layer of harder or corrosive resistant material to a less expensive base material). Other areas of interest by the Institute include the use of lasers in automated manufacturing and robotics, medical applications and microelectronic chip fabrication. For more information, contact Dale Allsopp, Program Supervisor, The Alberta Laser Institute, 9924 - 45 Avenue, Edmonton, Alberta T6E 5J1 ..... **Alberta Telecommunications Research Centre** (ARTC) has appointed Dr. John Elliott, formally of BNR Ottawa, as Chairman of the board, effective January 20, 1987 ..... The ATRC is offering scholarships and financial awards for graduate students wishing to pursue graduate or post doctoral studies related to the telecommunications research programs of the ATRC. Three major awards, from $6,000 to $20,000 per year, are available. For more information, contact: Chairman, Scholarship Committee, Alberta Telecommunications Research Centre, Research Centre One, Edmonton Research and Development Park, 9415 - 20 Ave., Edmonton, Alberta T6N 1E5 ..... **Alberta Microelectronic Centre** opened its Calgary Design Facility in September and its Edmonton Manufacturing Facility in December. Custom chip work is currently being carried out by L.S.I. Logic Canada ..... **Maloney Steel Ltd.**, of Calgary, has been commissioned to build a 15,000 litre toll fermentation vessel at the **Alberta Research Council's** biotechnology pilot plant in Edmonton. How big is a 15,000 litre container? If filled with milk, it would take a family of four, drinking two litres a day, over 20 years to drain it. The pilot plant focuses on developing efficient biotechnological processes to help companies bring their products quickly and economically to commercial production following the laboratory research stage ..... **BIOSIS**, a biological pest control company from Palo Alto, recently signed a three year contract with the Research Council to scale up a project for developing a natural alternative to chemical pesticides. Biosis President, Albert Morris, said the choice was based on the fact that "the Alberta Research Council is known to have the finest facility of its kind in the world". The company will be moving people from Palo Alto, California, to take part in the scale-up work ..... **Electronics Test Centre** has appointed John K. Newton as Director, Technical Operations, effective November 1, 1986. Mr. Newton is responsible for managing the facilities in the client testing area. The Test Centre offers a wide range of evaluation, testing and consulting services to the electronics industry ..... The Electronics Test Centre has signed a Memorandum of Understanding with the Saskatchewan Research Council in order to assist the electronics industry in Saskatchewan. Negotiations are planned with other western provinces for similar agreements.

ARC's Biotechnology Pilot Plant is considered the finest of it's kind in North America

Custom Chips Expand Rural Telephone Use

Trison Instruments of Sherwood Park, Alberta has taken delivery of the first custom chip manufactured by L.S.I. Logic Canada. L.S.I., a world leader in the manufacture of microchips, located its Canadian headquarters in Calgary as part of a $24 million technology transfer agreement signed with the Government of Alberta in 1985. Trison Instruments Ltd. is an Alberta owned company, and has been in operation since 1969.

The microchip was designed by Trison as an integral part of a rural or party line bridging device that allows telephone party line users to expand their telephone use to include extensions, answering machines, wireless telephones and computer modems. The bridging device also improves the reception quality of the telephone line.

Presently, an Alberta Government Telephone (AGT) party line with four subscribers can only handle four telephones. Leo Tachuk, President of Trison explained that the Trison invention will allow each subscriber to hook-up four telephones or telephone devices.

AGT is testing the apparatus in the Vegreville area. Manitoba Tel and other Canadian telephone companies are interested and will watch for favorable test results.

UPDATE

➪ The Alberta Government has invested $15 million in **General Systems Research Inc.** (GSR). The investment will be in the form of preferred shares that will be redeemed by GSR over a five year period. As part of this investment with GSR, the Government of Alberta also converted a $2.5 million debenture into Common Shares. The Edmonton-based company, founded in the early 1970's, has developed one of the world's most advanced computer-aided laser cutting systems used to cut quality industrial materials, such as upholstery fabrics, composite plastics and patterned textiles. GSR is also involved in the manufacture of laser guidance systems and aerospace components.

➪ The **Spurt Investment Fund I** could receive $2 million from the Government of Alberta over the next four years to provide equity investments in seed and early-stage technology enterprises. The fund is intended to support emerging high-tech companies which are at the conceptual, research or prototype stage of development. $500,000 has been allocated for 1986-87, with provision for additional funding of $500,000 for three successive years. In addition to seed capital, the SPURT investment fund also provides financial, management, engineering and marketing resources.

➪ The Alberta Government has received $235,000 in preferred shares from **D & S Petroleum Consulting Group Ltd.** to further develop and market a knowledge based system for well-log analysis. The D & S Group was established in 1964 to provide professional consulting services, software products and computer services to the petroleum industry. Services include all aspects of exploration, drilling, development, economic evaluations, reservoir evaluations, enhanced recovery, computer software development and project management.

➪ Phase I of a two-part **Advanced Manufacturing Study** sponsored by the Alberta Research Council and the Department of Technology, Research and Telecommunications has been completed. Phase I consisted of a needs assessment to determine what the industry requires for future development and how government might assist. Phase II will comprise a business plan with recommendations as to what government could do to encourage the continued evolution of advanced manufacturing technology. Release of study is expected in June.

➪ Eleven Chinese researchers have arrived in Alberta as part of the **Science and Technology Agreements** signed with the Chinese province of Heilongjiang. In March 1985, a science and technology agreement was signed in Harbin, China. The Alberta Research Council and the Heilongjiang Academy of Science signed a similar agreement in Edmonton in May 1985. Of the four recent arrivals, two are working with Alberta Forestry in seed processing, bareroot container crop production and tree regeneration, one is working with the Alberta Research Council on the Poplar Tree Study and the other is studying at the Remote Sensing Centre of Alberta Environment.

➪ **Novatel Communications Ltd.** of Calgary expects $35 million in domestic sales of its cellular radio telephones and peripherals with its appointment as a Bell Cellular agent. Novatel expects to exceed the Canadian units sales mark of 15,000 this year. Novatel is also doing well in Australia, where a one year $6 million deal was signed with Air International of Australia, and in the United Kingdom where they are near to closing a one year $26 million deal with an undisclosed company.

➪ The first International Board of Review report, assessing the impact and effectiveness of the activities of the **Alberta Heritage Foundation For Medical Research** from 1980 to 1986, has been completed. The seven member review board's findings highlighted the positive impact the Foundation's programs have had in attracting medical professionals to Alberta. This is due to the opportunity for collaboration with first class scientists in many disciplines, preservation of research time, availability of establishment grants and the ability of research training programs to attract first rate graduate and postdoctural students. The report's authors also indicated that the Foundations programs "... have produced a unique medical research milieu that is likely not matched elsewhere in the world." Review Board members were: Dr. J.C. Laidlaw, Toronto; Dr. Andre Archambault, Montreal; Dr. Robert Berliner, New Haven, Connecticut; Dr. Maxwell Cowan, St. Louis; Prof. H.J. Evans, Edinburgh; Dr. Edwin G. Krebs, Seattle; and Dr. Robert B. Salter, Toronto.

FEB - 4 1988

A Grass-Roots Technology Transfer

Transferring technology to the private sector is one of the major challenges of the late 20th century. New technologies are being developed at research councils and Canada's universities, but it is up to the private sector to find the markets for these innovations.

Such a transfer has recently taken place out of the University of Alberta. Dr. Ian Weijer and Barry Hill, plant geneticists at the university, have sold the world rights for 19 low maintenance grass strains to Texbeau Industries Inc. of Edmonton.

Over the next two years Weijer and Hill will receive $7.7 million for the low maintenance grasses, which only grow a few inches a year and require little watering or fertilizing. Many of the strains are also self-weeding.

Texbeau Industries will be changing its name to International Low Maintenance Grasses Inc. as it attempts to capture a significant portion of the world's $400 million per year grass seed market.

Publications

Alberta Electronics Directory
A revised index of Alberta electronics manufacturers has been completed. Company profiles and product information are featured.

Research for Sale
A directory of university labs and other research facilities in Alberta which will carry out research work for private industry. Information regarding services, fees and contacts are included. Although this publication does not cover all research areas (the next edition will be greatly expanded), it is an excellent source of research information in the areas of engineering, pure sciences and emerging technologies.

High Technology
General information about high technology in Alberta and the government's role in supporting and promoting the development of new technologies.

Health Care Industries
A publication about medical research and the development of related services and high technology industries in Alberta.

These publications are available by writing Corporate and Public Relations, Technology, Research and Telecommunications, 12th Floor, Pacific Plaza, 10909 Jasper Avenue, Edmonton, Alberta T5J 3M8.

Alberta
TECHNOLOGY, RESEARCH AND TELECOMMUNICATIONS

Cleanest Place... cont'd from page 1

Once they are as clean as clean can possibly be, the workers devote themselves to the task of building the microelectronic circuits that will help Alberta business remain competitive in the future.

Officially opened in December 1986, the Alberta Microelectronic Centre helps Alberta companies improve productivity by identifying and adopting microelectronic applications for their products and operations.

The main thrust of its work is in the area of electronics product manufacturing, which could include such companies as Northern Telecom and Novatel Communications.

The majority of the microelectronic design is carried out in the Centre's Calgary facility, which is fully operational. The Edmonton plant processed it's first industrial product March 4, 1987.

Companies interested in learning more about the Alberta Microelectronic Centre should call or write:

Len Friedenberg
Alberta Microelectronic Centre
#118, 11315 - 87 Avenue
Edmonton, Alberta T6G 2C2
Telephone: (403) 432 - 3914

Next Issue

Laser Technology Alberta Style

Developed over 26 years ago, lasers have become commonplace tools of industry, electronics, medicine and research. Learn about lasers from their use in bladder cancer surgery to industrial applications, such as the cutting and cladding of metal.

Canada Post Postage paid / Postes Canada Port payé
Bulk third class / En nombre troisième classe
4627
Edmonton, Alberta

Supercomputer May Mean Super Results

British Petroleum (BP) Resources Canada Ltd. recently received two supercomputer time grants to conduct research on the supercomputer at the University of Calgary. If successful, these studies could develop new technologies for Alberta's petroleum industry.

Of the two new BP projects, the first is the development of a model that will test new methods of extracting as much oil as possible from a proven oil field. Much like wringing a damp sponge, the process will try to squeeze as much oil as possible from a proven reservoir after primary and secondary methods of obtaining oil have been exhausted.

The supercomputer is used because such extraction techniques are expensive and sophisticated. BP will generate a model on the supercomputer, and will carry out calculations from the model before money is actually spent on new procedures in the field.

The company is also testing the use of oxygen injection in oil sands as a means of enhancing recovery. This model will use historical field data, results from steam injection into test wells, and basic engineering principles. BP hopes that oxygen injection will prove to be a commercially viable oil sands recovery technique.

The Supercomputer Allocation Committee provides grants to commercially viable research and development projects that have the potential to benefit Alberta's economy.

The grants are part of $10 million of prepurchased supercomputer time provided by the provincial government when the system was installed in February 1985, and consist of time on the supercomputer, a Cyber 205 installed by Control Data Ltd.

The role of the supercomputer is to enable companies to create a model or simulation of an idea instead of investing money on research in the field. Since it operates up to 100 times faster than a regular computer, the Cyber 205 can handle large amounts of data and a large number of variables, thus making the computer model as close as possible to actual field conditions.

Companies interested in obtaining access to the Alberta Supercomputer should call Supercomputing Services, University of Calgary at (403) 284-6451.

Published by Alberta Technology, Research and Telecommunications, 12th Floor, Pacific Plaza, 10909 Jasper Avenue, Edmonton, Alberta T5J 3M8

Managing Editor:
Wayne Telfer
Contributors:
Eric Bergman
Karen MacDonald

Comments, suggestions and contributions are welcome. The contents of this publication may be used in whole or in part with acknowledgement to Techciting Alberta.

Eureka / Toep Projects

The federal government has committed over $20 million for participating companies and research institutes for its Technological Opportunities in Europe Program (TOEP) to encourage participation of Canadian companies in EUREKA High Technology Projects. This program will contribute to growth of high technology in Canada by promoting industrial cooperation between Canadian and European companies.

Under the Eureka Program, European companies are formulating projects for the development and commercialization of products and processes in a number of areas. Canadian companies must work out an agreement with the European companies to qualify for federal funding. Research work can be carried out within the company or at public research facilities such as provincial research councils or universities.

The federal government will also assist in the identification of European company partners as well as providing financial assistance for Canadian companies to meet with European counterparts.

Alberta companies can contact Ken Ball, Director, Advanced Materials and Processes, Technology, Research and Telecommunications at (403) 422-0561, Telex 037-42687, Telefax 420-1474.